

TRANSCRIPT
Health Innovation Panel
Research Canada's 2009 Annual General Meeting
Chateau Laurier Hotel, Ottawa
MacDonald Room
October 21st, 2009
10:30 am – 12:00 pm

Welcome: Dr. Michael Julius

Dr. Michael Julius, Chair of Research Canada, welcomes guests and speaks about the official launch of the Health Research Caucus at the upcoming luncheon and the presentation which will be given by Dr. Ilse Treurnicht, CEO MaRS Discovery District.

Dr. Julius indicates that he is privileged to be the Chair of the Board of Research Canada and that it is his pleasure to govern this impressive group of panellists. He also acknowledges the key sponsors of the event and thanks them for their commitment and on-going support. The sponsors include: The Research Institute of the McGill University Health Centre, SickKids Research Institute, Thunder Bay Regional Research Institute, University Health Network and York University.

Speaker Biographies

Dr. Julius introduces the panellists and provides a brief background on each:

Dr. Philippe Gros obtained his Ph. D. in Experimental Medicine from McGill University and following post-doctoral training at Massachusetts General Hospital and MIT, joined the Department of Biochemistry at McGill, where he has been a full Professor since 1994. He is a member of the Center for the Study of Host Resistance and the Director of the Complex Traits Program at McGill. His main area of investigation concerns the genetic analysis of susceptibility to infections, pre-disposition to neural tube defects, and models of carcinogen-induced cancer. Dr. Gros has been an International Scholar of the Howard Hughes Medical Institute, a Distinguished Scientist of the Canadian Institutes of Health Research and a James McGill Professor. He has received the Wilder Penfield Prize for Health Sciences (Prix du Quebec), the Canada Council Killam Prize for Health Research, and is a fellow of the Royal Society of Canada. Dr. Gros acts governmental organizations, including the Burroughs Wellcome Fund and the Canadian Institutes of Health Research.

Dr. Tony Cruz is one of the founders and serves as the Chairman and Chief Executive Officer of Transition Therapeutics Inc., a NASDAQ and TSX publicly traded company. Transition has two leading disease modifying therapies in Alzheimer's disease and diabetes in clinical development that are partnered with Elan Pharma and Eli Lilly, respectively.

Dr. Cruz was Co-founder of Angiotech Pharmaceuticals Inc and served as Vice-President of Research and as a member of the Board of Directors. In addition, Dr. Cruz has founded three other biotech companies which have been successfully sold to publicly traded biotech companies.

Dr. Cruz has a successful academic career with over 150 publications. He was a senior scientist at Mount Sinai Hospital and a Professor at the University of Toronto until 2008. He was one of the founders and served as Scientific Officer, CEO, and President of the Canadian Arthritis Network

until 2001. Dr. Cruz has also served as a consultant for biotechnology companies and investment firms.

Dr. Shelly McNeil earned her MD from Dalhousie University in 1994. She completed Internal Medicine training at Dalhousie in 1997 followed by a Fellowship in Infectious Diseases at The University of Michigan School of Medicine. She returned to Dalhousie as a consultant in Infectious Diseases and Assistant Professor of Medicine in July 2000.

Dr. McNeil's primary research interest lies in the epidemiology, prevention and management of infections in the elderly. Her recent work has focused on the epidemiology of antimicrobial resistance in Nova Scotia Long-term Care Facilities and on antimicrobial utilization in this setting. Dr. McNeil also works with Drs. Scott Halperin and Joanne Langley at the Clinical Trials Research Center where she is involved in early-phase clinical trials with novel adult vaccines.

Mr. Mark Levonen is President of Sanofi Pasteur Limited and a member of the company's North American Board of Directors. Sanofi Pasteur researches, develops and manufactures vaccines for Canadians and for export to global markets.

Mr. Lievonen has been with the company since 1983. He started in the treasury department and was promoted to Corporate Vice President, Finance, in 1988. Since 1990, Mr. Lievonen has held a number of senior management positions, including responsibility for the company's commercial operations.

Prior to his appointment as President in March 1999, Mr. Lievonen was Senior Vice President and General Manager of the Oncology Business Unit. He was responsible for the strategy and funding of Sanofi Pasteur's Cancer Vaccine Program and the global marketing and sales of its cancer immunotherapeutic products.

Mr. Lievonen holds a BBA in accounting and an MBA in finance and marketing from the Schulich School of Business, York University. He is a Chartered Accountant and received his designation in 1981 while working with PricewaterhouseCoopers.

Mr. Lievonen is currently a member of the Board of Oncolytics Biotech Inc., the Ontario Institute for Cancer Research, and the Ontario Genomics Institute where, he served as Chair from 2004-2008. He has also served on a number of industry boards and councils such as BIOTECANADA, where he was Chair from 2000 to May 2003, and on the BIO Council, an advisory group to the Government of Ontario in biotechnology. He was Chair of the Steering Committee for the BIO 2002 International Conference which was held in Toronto in June 2002. Mr. Lievonen is a member of the Board of Governors of York University and serves on the Markham Stouffville Hospital Foundation Board. He also served as a member of the United Way of Greater Toronto Cabinet chairing the Health Care Division.

Mr. Lievonen was the recipient of a Queen's Golden Jubilee Medallion in 2002 and was named a Chevalier de l'Ordre National de Mérite by the government of France in 2007. He was elected as a Fellow of the Institute of Chartered Accountants of Ontario in 2009.

Dr. Alain Beaudet, MD, PhD, is the President of the Canadian Institutes of Health Research (CIHR). As President, Dr. Beaudet acts both as Chair of the Governing Council and Chief Executive Officer of CIHR. Before joining CIHR in July 2008, Dr. Beaudet was the President and Chief Executive Officer of the Fonds de la recherche en santé du Québec (FRSQ), a position held since 2004.

Among his many accomplishments, Dr. Beaudet built a distinguished career at the world-renowned Montreal Neurological Institute (MNI). He headed the MNI's functional neuroanatomy laboratory, pursuing basic research into the action mechanisms and role of neuropeptides in the central nervous system, the control of intracellular receptor trafficking and its involvement in neuron signalling and new pain therapies. From 1985 to 1992, Dr. Beaudet was associate director (research) at the MNI. He has also taught in McGill University's Neurology-Neurosurgery and Anatomy-Cell Biology departments. Dr. Beaudet has written more than 175 original articles and some 40 monographs and book chapters.

Dr. Beaudet has received numerous grants and distinctions, including the Killam postdoctoral fellowship, grants from the Medical Research Council (MRC), CIHR and FRSQ, and the Murray L. Barr Junior Scientist Award. In September 2004, he was awarded the Prix Adrien-Pouliot by the Association francophone pour le savoir (Acfas). He served as president of the Canadian Association for Neuroscience from 1995 to 1997 and has sat on many peer review committees, both in Canada (FRSQ, MRC) and elsewhere (National Institutes of Health, Human Frontier Science Program). In 2007, France bestowed the *Order of Academic Palms* distinguished Officer's award to him and he was made Doctor *honoris causa* of Université Pierre et Marie Curie.

Dr. Beaudet earned a medical degree and a PhD in neuroscience from the Université de Montréal. He did postdoctoral training at the Centre d'études nucléaires in Saclay, France and the University of Zurich's Brain Research Institute in Switzerland.

Panel Discussion Process

Dr. Julius welcomes the panellists once again and thanks them for taking the time to be with us this morning. He tells them we're looking forward to their insights.

Dr. Julius informs the panellists that Research Canada is proposing the following question to frame the panel presentations and discussion:

How can the health research industry in Canada continue to strengthen its contribution to the health of Canadians and the prosperity of our nation?

Dr. Julius further outlines the objectives for the discussion:

Objectives

- 1) To have each panellist respond to the above question from the perspective of their respective position within the health innovation system in Canada. Each response should be guided by the following sub-questions:
 - a. What are we doing well in Canadian health innovation?
 - b. What are we not doing well and where are there gaps?
 - c. What are our commercialization challenges and opportunities?
- 2) To have each panellist provide their perspective from where they sit within the Canadian health innovation system to the innovation themes and six areas of attention identified at the recent Public Policy Forum event, **Science Day in Canada**. (May 2009) The following is a brief summary of these themes and areas of attention: (The full document is provided separately).

Themes:

- the need for a clear vision shared by all sectors;
- a commitment to support the full spectrum of research;

- funding which is distributed effectively and transparently;
- an emphasis on commercialization and application;
- the vital importance of attracting and retaining talent; and
- better communication of science, research and innovation to the broader public.

Dr. Julius briefly reviews the format for the discussion with the panellists and the audience:

- Brief presentations from each Speaker (10 minute each or 50 minutes in total)
- Discussion among panellists (15 minutes)
- Questions from the audience (15 minutes)
- Concluding Remarks by Dr. Michael Julius (2 minutes)

Explanation of the term, “Industry”

Dr. Julius explains that we have deliberately chosen the term “industry” to define the health research innovation continuum in its broadest sense: And while the use of this term is generally associated with the commercialization of “products” of this continuum, more specifically extraction of economic gain from knowledge, I underscore that commercial gain does not accurately capture the full return on investment of the health innovation system. There is much knowledge that is created within our industry that has an impact on health, and health care delivery that cannot be commercialized –but that is both fundamental to a functional health innovation system and reflects the posture of our health care system in Canada.

Speaker presentations

Dr. Philippe Gros:

Thank you. I will try to provide a perspective on the questions. My own training is in science. I am an academic with a research group – also started biotech companies and I have been a member of CHIR Governing Council for several years.

What are we doing well? A few things:

- We have an excellent educational system. We can produce highly qualified personnel, graduate students and specialized manpower. Our universities rank among the best internationally.
- From the research standpoint we are doing reasonably well in productivity and innovative research at least in my area which is genetics. Canada is recognized as one of the world’s leaders.
- We have a reasonable research budget (although we can argue about the amount). CIHR has experienced a two-fold increase in its budget within the first 4 to 5 years of its inception.
- There has been some past major investments from government in human resources; in the form of special initiatives such as the Canadian Foundation for Innovation, the Canadian Research Chairs, and Genome Canada. These are huge but targeted investments
- We have a publicly funded health care system – i.e. to conduct clinical trials and KT – this helps.

- We have a strong presence in the private sector – Canadian human resources in biotech and within the pharmaceutical industry. This should set the stage for Knowledge Translation (KT).
- There is a general public recognition of the value of research in Canada.

Where are we not doing so well?

- Very poor coordination of investments. For example, we spend money in infrastructure and in salary awards for Canada Research Chairs, but there is no significant increase in the budget of CIHR to provide the money to carry out research.
- Branding is an issue. It is important for the government to identify special projects to specific targets and it is difficult to push an agenda that is viewed as non strategic – i.e. need to invest in basic discovery research.
- There is a strong need to increase the CIHR budget. We have low rates of investment into innovative research; we tend to retreat to things that are secure.
- We experience extreme fragmentation of funding envelopes – e.g. CIHR is trying to be everything to everyone. We have multi low budget targeted initiatives. This creates a false sense of a need to be strategic. It is not always clear that the capacity is there or that the choices are broadly justified.
- There has been a change in the priorities in funding profiles. One year we fund –salary the next year we fund big teams, the following year we cancel this program. We need continued funding from a stable steady budget.
- There is room for improvement around knowledge translation in tangible health outcomes. There is a need for better cooperation between the provincial/territorial and federal research agendas and a better uptake of research results.
- We can do better in facilitating linkages to leverage research dollars.
- The commercialization challenge is a big one, a “greasy octopus”. How do we do it? We should have reasonable expectations and adjust the strategy to the end user need. We have a healthy strong pharmaceutical sector and we need to consult with them about what they need.
- Some universities (at least mine) provide a low level of investments in tools and in enabling commercialization. The budget for technology transfer is often the last to be considered.
- There are major gaps in financing commercial activities; venture cap – etc. There is a lack of dollars to finance early stage speculative projects.

Dr. Tony Cruz:

- One of the things I noticed when I was an academic is that there is a huge gap between science and development of innovation. But how do you deal with the gap between that and where industry is coming from? In order for any technology to make its way it requires biotech, investors and big pharma. It is not just a better technology transfer office, but a process to develop technologies that can attract industry and investors. It is a long term project to take a product through to market: 10 – 15 years, sometimes 25 years. This costs hundreds of millions of dollars which is a big commitment and is in itself a big hurdle
- We also need to try to understand what’s involved in taking a technology from the lab and positioning it to attract a partner. We need to fund science then fund development. Our

operational expertise is good in Canada; we have people who can move the products along.

- Critical to moving technology will be investors. There are two sources of funds: one from capital markets and other from big pharma who can come in and support programs.
- Canada is strong in science. We are competent in operations, but less so in management. We need experienced managers and CEOs to take products to the next level.
- We also fail in the investment. For example, taking a product from a university to Phase 2 study requires \$15 – 30 million. I don't know where you are going to get that in Canada, but if you can't, you cannot develop technologies.
- Back in early '90s we had venture capitalists (VC's) on board and they got together to fund companies. There was access to cash. Then in early 2000s the VC's disappeared. We then tried to mimic the resource sector by going to the retail investors to fund companies. There were about 50 companies in the CDNX, which then became the TSX venture exchange. It was a way to fund small companies. Today the retail investor is gone. There is a lack of biotech investors in Canada except for some high net worth individuals and of course, some US funds.
- Big pharma has changed drastically. We have seen and will see a lot of mergers. This sector has to reduce costs and have access to pipeline, reduce sales force. We will have a different pharma; there will be fewer companies who will invest as much in early stage development. They will need to replace patents that are expiring and generics will take over. 60 to 70% of revenue could decline for some companies over the next 5-6 years.
- We are great at science and have the opportunity to fund companies in the \$10 – 25 million range. That will fill a vacuum for industry. We can take a product from early stage discovery to PHASE 2 and then find a partner. Big pharma is approaching small biotech to do some of this work for them.

If we are serious, we need to:

1. Develop a strategy for where we want to be strong; where to go and how to do it. We need to get together and decide on 1 – 2 areas to focus on to build strong innovation and Biotech sector.
2. We need to create a culture that builds wealth and return on investment. People have lost money in biotech. Biotech is more milestone driven and presents a larger risk for a larger return. There is potential for failure. The government needs to build a culture that can allow us to invest and attract individuals to build wealth and distribute the wealth back to the innovation.

Dr. Shelly McNeil:

- I bring a different perspective. I am a clinical scientist at Dalhousie University and I develop new vaccine technologies. I am speaking as a clinical researcher and will provide a flavour of our experience in Halifax which may illustrate some of what we are doing right and can point to what we are not.
- The Canadian Center for Vaccinology was established to evaluate vaccines and new vaccines that have impact on public health in Canada and overseas. It is a collaboration among Dalhousie University, the IWK Health Centre and Capital Health, and was originally funded from the federal government through the Canada Foundation for Innovation and the NSHRF. Sanofi Pasteur recently donated to our new Vaccine Challenge Unit.

- The Center is a concrete example of the power of strategic partnerships between government, academia, industry and not-for-profit groups, e.g hospitals, clinical trials facilities, training, etc. It contains a containment level 3 laboratory which is one of its newest and most exciting features. We have an integrated multi discipline research team including 40 investors and 60 staff.
- The Center collaborates in biomedical research along the continuum of vaccine research across the spectrum including clinical trials and vaccine program and policy evaluation. We have 30 trainees with a variety of investigators – we provide an environment to train the next generation of vaccine researchers.
- The Center along with others across Canada can provide a nation-wide network for vaccine research.
- The Center has played a role in the development of the pertussis vaccine - an example of leadership and innovation . . . connecting research with the generation of income. Dr. Scott Halperin is the Director of the Center and has worked with partners at Sanofi Pasteur and across Canada to bring the vaccine to implementation. The Center conducted . . . and animal model trials before human and phase 1 and 2 clinical trials – and today we can say that this vaccine has been developed, evaluated and produced in Canada.
- Ability of the Center to conduct broad based epidemiological research such as the increasing rates of pertussis disease and this knowledge allowed for the push for an adult form which was also developed in Canada and led by the CCV. It has been licensed and used in Canada.
- The Center is also looking at new ways to use these technologies and in other populations. There are now pertussis vaccine trials in pregnancy to protect newborn babies.
- A supported infrastructure is important to allow us as researchers to take advantage of funding opportunities and address critical knowledge gaps. Seen in the recent announcement of funding of the influenza research network – lead by the CCV – brings together 80 investigators and 30 institutions to inform Canada's response to the current influenza pandemic. We could not have done this without the infrastructure that we now have in place. That project is actively engaged in responding on a day-to-day basis to PHAC to respond to the pandemic – and we are also developing an infrastructure for ongoing safety that can be sustained long term.
- Another exciting development is the opening of the Sanofi Pasteur vaccine challenge unit at CCV, a further illustration of a commitment to innovative vaccine research. This will allow researchers in Canada and abroad to test vaccines at an early state of development – to reduce the time to approval. This is the first of its kind in Canada and one of few in the world.

What we are doing well:

- We excel in the building of focused research networks and have diverse networks
- We have more interdisciplinary approaches. We can take ideas from the lab and impact policy
- One of the biggest issues aside from a lack of money: We have difficulties in sustaining this kind of infrastructure over time. We have little strategic planning to ensure long term sustainability and so we continue to struggle to maintain what we have built. For

example, the pandemic influenza research network mobilized a lot of resources, but at the end of the 3 year grant we have no way to maintain it long term.

- There are examples around the world of better ways to do things, e.g. in the U.S., clinical trials units provide rapid clinical trials for a rapid response.
- Also with health policy research, we have no systematic mechanism in Canada to demonstrate the impact of what we are doing to improve the health of Canadians. In Australia there is a national centre funded by government

Mr. Mark Lievonen:

- It is a pleasure to be here. I bring the perspective of a major biopharmaceutical company with a significant Canadian history and presence. Very briefly, sanofi pasteur was founded in 1914 in Toronto. Over the years it prospered and worked with Banting and Best to play a key role in the communication of insulin, the development of the polio vaccine, and the eradication of smallpox.
- More recently, we were involved in the 5 component acellular pertussis story. One of few examples of a product that was researched, developed and manufactured in Canada and exported to the world. Dr. Scott Halperin and group played a key role in getting this licensed in Canada and the US.
- Our industry has experienced lots of merger and acquisitions over the years and there may be more to come.

Important themes:

- There are a number of themes underlying this question.
 - The importance of science and research
 - The importance of innovation
 - The need for commercialization
 - Money – both in terms of funding research and commercialization, and funding our health care system
- There seems to be a consensus that we have strong, academic and basic research in Canada yet there is a lack of commercialization.
- There are a number of groups studying this and the issue as it relates to other sectors including:
 - Research Canada
 - The STIC Report
 - The Council of Canadian Academies Report entitled “Innovation and Business Strategy: Why Canada Falls Short”
 - The Centre for the Advancement of Health Innovation (CAHI).
- They all inform the debate and discussion and provide an opportunity to build a Science and Innovation strategy for the country.
- CCA Definition of Innovation as “new or better ways of doing valued things”.

- We also need to understand what we mean by commercialization. Being a “downstream guy”, I think of commercialization as when we are selling products. Tony said that this can take up to 10 – 15 years after research and \$1 billion dollars. If you have programs that need a return on investment in 3 years – this will not happen. The alternative may be to define commercialization in different ways – i.e. identify certain milestones along the way.
- We also need to engage the public around the concept of innovation and science. We need to tell our story and need credible people to tell it. The public needs to get involved.

We also need to build an alignment of national intent at the federal/provincial/municipal level and across ministries: Health, Industry and Science, Training and Immigration. We need to build across the spectrum on all these levels and we need some alignment there.

Dr. Alain Beaudet:

It is a pleasure to be here. A lot of my points have been made so I will summarize and respond to some of the comments.

What are we doing well?

- There has been a massive increase in public research funding in Canada over the past 10 years. We have one of the world’s highest GERD to GDP ratios. CIHR’s budget alone has tripled.
- It is challenging because these investments need to be maintained. We need sustainability. We have to maintain our investments; otherwise we will lose our gains.
- Canadian published research has the highest impact in terms of citation in the world. If you look at clinical research papers, we are the most highly cited in the world and are #1 in terms of publication impact. Yet, we are not able to fully fund the best in the world at internationally competitive levels.
- We provide high quality research training at a reasonable cost – across the full spectrum of health and are an attractive country for foreign students – we need to attract the best and for this we need a vibrant research environment.

Where we are not doing quite as well:

- Public funding: this is a question of balance between capital and infrastructure investments, investments in personnel, and investments in the direct operations to perform the research. The idea is over the years to maintain the right balance between these related costs. Currently, we are lagging in the direct operating costs for research.
- While we are doing well in training and attracting high calibre researchers and we have been able to equip our infrastructure beautifully, we now need to take advantage of these people and fund them at the right level.
- There are other balancing acts we need to be careful of. We have to be more balanced between incremental and cutting-edge, innovative research. We can’t be afraid to take risks. To make an analogy with financial markets, we have to buy the odd risky stock if we want to have a breakthrough.
- The balance between applied research and basic science. This is a passionate issue and we must find a balance between the two. We also need a balance between funding big science and individual small teams. At the end of the day, all research is initiated and led by researchers.

- Canada is not on the map in funding big science. Where are our large national research endeavours, our “Hubbles”? We can be leaders on the world stage and this will allow us to secure high level and wide ranging collaborators and bring added value to the science. We will go further faster and with more impact.
- Rather than commercialization, I would prefer to use the word “*valorisation*”. This incorporates economic benefits, health outcomes and the health care system. As I travel across the country I hear about the sustainability and quality of our health care system. This is absolutely linked to research.
- We need to be much better in translating research into better health outcomes. I am speaking of bench to bedside – new therapies and devices tested; results synthesized; guidelines written and disseminated and taken up and integrated into care. This is the business of the provinces and health authorities as well as our hospitals, and primary care centers. Only when we work together can we improve our health system.
- As for commercialization and the private sector aspect, the pharmaceutical industry in particular and Biotech are moving fast and we need to keep up. We need to prepare students differently and for all labour markets, including the private sector. We need to rethink our interaction with the private sector, especially in the pre-competitive area. We need to make the infrastructure of our clinical research units more attractive for clinical research trials.
- Protecting their time and providing proper compensation for clinicians’ involvement in research is key to the integration of research and care. We must also make sure that we measure the impact and we make the results of the measurements known. We know that there is a remarkable return on investment on health initiatives (up to 40% return on investment yearly) and we must make that known and take the proper measurements to measure that impact – we are not doing well enough – we have to do this together and speak with one voice.

Discussion among Panellists

Dr. Michael Julius:

- Having heard this commentary related to 5 integral pieces of the health innovation value chain – I think that the resolve was clear - if these activities are not seamlessly tethered, we will not succeed.
- At this juncture I think it important to share with you a bit more explicitly what has been alluded to in some of the commentary from our panellists. Specifically, the work of the Public Policy Forum (PPF) in coordinating *Science Day*. The day was devoted to discussion of “innovation” and was attended by many of our nation’s thought leaders. The specifics focused on innovation and its role in both Canada’s economic recovery and global impact.
- PPF produced a report of the proceedings of Science Day entitled *Innovation Nation*, copies of which are available at the back of the room for your reading pleasure. Further I would like to acknowledge Paul Ledwell, a Vice-President at PPF and thank him and the PPF for setting up the science day.
- PPF could be a critical partner in our endeavors – we have the opportunity to provide their work with the specifics of innovation as it relates to health
- Now I’d like to return to the panel with the request for them to each address, from their perspectives, the needed actions to fill the gaps in our health innovation continuum that they’ve each identified

- And as you do this panellists, I would like to specifically explore your views on how a “planned” systemic approach to the issues they’ve raised might be of help. Specifically, the value add of articulating all of the activities, from discovery to successful commercialization and/or knowledge transfer; and understanding the interconnectivities and interdependence of these activities through consensus building amongst all of the stakeholders
- The product of this process would provide both a framework guiding strategic investments, and also guide the development of enabling policies
- Each of you have commented on what we do well and what we do less well. We agree that we need to build consensus, so how do we move from the description that you have provided to a table where we can be prescriptive and create instruments that policy makers can use

Dr. Philippe Gros: We have to look and see what has not worked – i.e. the president of CIHR was on the board of CFI – but that failed to bring coordination to spending. It was the same for Genome Canada. There was a CIHR representative, but no exit strategy for those that had the Genome grants – and no one going back to roost at CIHR. Even the National Centre for Excellence. . . We need to look at the decisions of the past. A lot of these initiatives took place in a vacuum of science policy. There was been no real science policy in place 10 – 15 years ago. We need to make sure that there is some consultation in a framework that will not change with a new government. This is where we can make a difference. We can bring people from basic science, agencies, the pharma sector – and get some sort of consultation on how to move forward.

Dr. Alain Beaudet: Regarding the lack of coordination – this has been commented on twice. I want to point out that we now have mechanisms to meet regularly at the federal level. The federal agencies meet at least once a month and at all levels. There is much better coordination and we are working on a number of issues to ensure that programs will be coherent with one another. We are starting to do that with the CFI and Genome Canada and have made a point to integrate. We may not have all the chicks coming to roost, but I sense already an enormous change in that direction. It is also important to say a word about the Health Research Funders’ Forum – bringing together the leaders of provincial health research bodies and charities and federal councils – to bring coherence into the funding of health research. This in fact led to the development of Research Canada. Our system is complex so coherence takes time but we are on the right path.

Dr. Michael Julius: We should take this as a call to action. Is there a pre-existing table that could take the lead? Or need we start afresh?

Mr. Mark Lievonen: In an ideal world...I would like to see us build a vision for the future that is informed by science and technology that the government endorses and the public embraces. One of our challenges is short-term political cycles. Having said that, we need to start incrementally and build up – small successes lead to others – e.g. various groups working together – try to get some traction – and celebrate our achievements.

For example, regarding commercialization, there are a couple of aspects, e.g. in addition to new products in therapeutic areas, innovation such as e-systems in hospitals – this is commercialization in the broader sense. We also need to look at the economic benefits that occur.

We embarked on a program in 1997 to develop cancer vaccines – and we recently needed to end the program, but we now have a facility being used as the North American Centre of Excellence for the development of vaccines for a wide range of infectious diseases

Dr. Tony Cruz: We need to move away from the generalities and focus on the objective – i.e. look at the health care benefits and those are important, but there is also economic benefit in the

generation of wealth and jobs. We need to separate those and also go back to the biotech sector which is driving innovation in moving science – and allowing flow through. The question is: as with any investment; who are the best people that have made money in this sector and have built jobs? Put them together and ask how to address the issues properly. We need to create an investor community and should not be dependent on government funding. We have not asked the right questions. We need to get specific and bring the right people.

Dr. Michael Julius: All of us should think about the appropriate combination of individuals to work in partnership to achieve this goal. And I think we would all agree that it cannot be a table of 400 people.

Dr. Shelly McNeil: What resonated with me from the clinical research perspective is about not only seeing success in commercialization, but also in *valorisation*. We need to demonstrate the benefits to health; these benefits may not always be economic. We need to have an evaluation strategy and plan before we start. If we are going to do vaccinology research and recognize the need to support all levels of research. We will not be able to demonstrate that we have benefited health. To get the shared vision, we need to agree – and we need a strategic plan to evaluate, not just counting grants. There needs to be people at both ends of the spectrum.

Questions from the Audience

Dr. Tania Watts, President of the Canadian Society of Immunology: I would like to comment: Immunization is a huge industry now and in the future, but you have to go back to the drug breakthroughs in the 70's and 80s to generate these profits. I would also like to suggest that real reason Canada is not as good at innovation is because we need to fund the entire spectrum. . . from translational research, back to basic research. I would like to make a plea to increase the pot that goes to non strategic general research. We need to keep selling . . . the government wants flagship programs.

Dr. Bernie Bressler, Professor at UBC and VP Research Vancouver Coastal Research Institute, Board Director, Research Canada: We have a cultural problem in Canada. It was alluded to, mostly by the private sector here. You both talked about culture. I think we need to invite people to the table from the forestry sector, and the mining sector, we need people who make tractors. We don't have a culture in this country – but want to ask government . . . for research. We also don't like to take risk. How do we get there and then move back down to the things that were just said.

Dr. Tony Cruz: That is true. We don't have a critical mass of success and with success comes investment. In the 90s we got all psyched up – but the money for innovation disappeared in 2000. We lost the original investors. Until we create a culture . . . we need to look at how we started again – the foundation is strong as ever – great funding and science, but we are all Canadian only and this is a global economy. Canadian research can provide the platform to build – i.e. in Boston. That way we will attract the investment community.

Mr. Mark Lievonen: I agree about the culture issue. During Science Day we talked about culture as a force for innovation. We will get to hear more during lunchtime.

Dr. David Hill, London Ontario, Scientific Director, Lawson Health Research Institute and Board Director, Research Canada: We need to think about balance. If we are talking about how to advise government on how to create a helpful research policy, we can't divorce this from the problems of maintaining health and the health system in Canada. Our model has a higher inflation rate and all aspects are likely to add costs. For example, when we bring a new imaging innovation to Ontario – there are groans from the Ministry because it means more costs for the health system. The idea of implementation of innovation in the Canadian health system – and the

mechanism to do that. . . We need to link innovation to our health system – if we don't we won't get it done.

Dr. Luis Barreto, Vice President, sanofi pasteur and Board Director, Research Canada: Shelly you made a point about sustaining the clinical trial infrastructure – one of the turning points that I have seen between Canada and the US – was the whole issue of considering infectious disease as a threat to national and global security and that is why the NIH had sustainable funding – to keep the country in a state of readiness for threats such as anthrax, small pox etc. Is this something that we should be thinking about in the midst of the current pandemic? As we move forward – is this an opportunity for us?

Dr. Shelly McNeil: That was the point I was trying to make – in this instance the federal government and CIHI made a strategic investment for a problem in the future that turned out to be in the immediate present. Now we have the best vaccine minds in Canada that will allow us to demonstrate to Canadians – that immunization is strong in Canada – but the reality of the situation was that it was spurred by an immediate need and it may fall apart in 3 years. We now need an investment to allow ongoing investment. We will need to demonstrate that we are making a difference. The point is to improve health, however unless we build the evaluation mechanism, we will keep doing pilot and one off projects and we will be out of luck to respond quickly

Dr. Alain Beaudet: In fact, our work on pandemic preparedness started long ago and has been sustained to date, with a lot of dedicated investments made ever since the SARS situation in 2003. It is because we had invested in the development of a pandemic preparedness research network that we were able to respond so rapidly and be ahead of the game. Those are sound foundations which we will want to maintain over time. . . .

Mr. Mike Brennan, CEO, the Canadian Physiotherapy Association: I have a question: If we make an assumption that our market cannot sustain a truly vibrant system and if government is more interested in funding and not driving up costs, can we have this without colleagues from US and NAFTA. Can Canada innovate its way into national markets?

Mr. Mark Lievonen It will be important to first be successful in Canada and then expand to the world. Our own experience is that we need to be successful here to do that – would like government to consider that – topic for another day.

I have also heard from colleagues that in Canada you have to be successful first in the US to be successful in Canada (e.g. Canadian actors and comedians).

Concluding Remarks: Dr. Michael Julius

Dr. Julius closes by saying that this is the beginning of the conversation: We are contemplating vehicles through which we can continue the conversation.

We will be creating a report of the proceedings of this meeting that will be on the Research Canada's web-site.

Dr. Julius thanks each of the panel members and the participants for attending, with the commitment on behalf of Research Canada to move this dialogue forward.